# EPI-GAZETTE

April 2013, Issue 152

The Florida Department of Health in Seminole County
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# New Carbapenem-Resistant Enterobacteriaceae Warrant Additional Action by Healthcare Providers

***Information from CDC Health Advisory, February 14, 2013***


**Summary**

Carbapenem-resistant Enterobacteriaceae (CRE) are untreatable or difficult-to-treat multidrug-resistant organisms that are emerging in the United States. Because of increased reports of these multidrug-resistant organisms, CDC is alerting clinicians about the need for additional prevention steps regarding CRE. Key points include:

- While still uncommon, reports of unusual forms of CRE (e.g., New Delhi Metallo-β-lactamase and Verona Integron-mediated Metallo-β-lactamase) in the United States are increasing. Of the 37 unusual forms of CRE that have been reported in the United States, the last 15 have been reported since July, 2012.
- This increase highlights the need for U.S. healthcare providers to act aggressively to prevent the emergence and spread of these unusual CRE organisms.
- Current CDC guidance includes key elements of CRE prevention (e.g., use of Contact Precautions) in healthcare settings.
- Because the vast majority of these unusual organisms were isolated from patients who received overnight medical treatment outside of the United States, additional measures described in this HAN advisory are now recommended to be taken when such patients are hospitalized in the United States.


**Background**

*Klebsiella* species and *Escherichia coli* are examples of Enterobacteriaceae, a family of bacteria that normally live in water, soil, and the human gut. CRE are Enterobacteriaceae that have developed high levels of resistance to antibiotics, including last-resort antibiotics called carbapenems. CRE infections most commonly occur among patients who are receiving antibiotics and significant medical treatment for other conditions.

**Also in this issue:**

Although there are a large number of mechanisms that can lead to carbapenem resistance among Enterobacteriaceae, the production of an enzyme that breaks down broad-spectrum carbapenem antibiotics (carbapenemases) has emerged as an important mechanism in the United States over the last decade. Most carbapenemase-producing CRE in the United States produce a carbapenemase called *Klebisella pneumoniae* carbapenemase, or KPC, which was first reported in 2001 and has been found in many different types of Gram-negative bacteria.

KPC-producing Enterobacteriaceae appear to have spread throughout the United States since 2001 but still remain relatively uncommon in most hospitals. Enterobacteriaceae producing other carbapenemases, such as New Delhi Metallo-β-lactamase (NDM) and the Verona Integron-mediated Metallo-β-lactamase (VIM), have been very uncommon in the United States but are more common in other parts of the world. Many countries may not be actively looking for CRE; therefore, it is unclear which countries have experienced unusual carbapenemases (e.g., NDM, VIM) and it is difficult to know their overall incidence at any given time. The vast majority of CRE producing non-KPC carbapenemases reported to CDC were isolated from patients with a history of an overnight stay in a healthcare facility outside the United States.

**Recommendations**

CDC continues to recommend that facilities follow the CDC guidance for preventing the spread of CRE in healthcare settings (http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html). Facilities should:

- Ensure that the patient is on Contact Precautions.
- Reinforce and evaluate adherence to hand hygiene and Contact Precautions for healthcare personnel who come into contact with the patient (e.g., enter the patient's room).
- Since clinical cultures will identify only a minority of patients with CRE, screen epidemiologically linked patient contacts for CRE colonization with stool, rectal, or perirectal cultures. At a minimum, this should include persons with whom the CRE patient shared a room but could also include patients who were treated by the same healthcare personnel. A laboratory-based screening protocol is available here: (http://www.cdc.gov/HAI/pdfs/labSettings/Klebsiella_or_Ecoli.pdf).
- Should the patient be transferred to another healthcare facility, ensure that the presence of CRE colonization or infection is communicated to the accepting facility. An example transfer form is available here: (http://www.cdc.gov/HAI/toolkits/InterfacilityTransferCommunicationForm11-2010.pdf).
- Dedicate rooms and staff to CRE patients when possible. It is preferred that staff caring for CRE patients do not also care for non-CRE patients.
- Remove temporary medical devices as soon as they are no longer needed.

In addition to that guidance, CDC now also recommends the following:

- When a CRE is identified in a patient (infection or colonization) with a history of an overnight stay in a healthcare facility (within the last 6 months) outside the United States, send the isolate to a reference laboratory for confirmatory susceptibility testing and test to determine the carbapenem resistance mechanism; at a minimum, this should include evaluation for KPC and NDM carbapenemases.

- For patients admitted to healthcare facilities in the United States after recently being hospitalized (within the last 6 months) in countries outside the United States, consider each of the following:

    ◊ Perform rectal screening cultures to detect CRE colonization.

    ◊ Place patients on Contact Precautions while awaiting the results of these screening cultures.

# Carbapenem-Resistant Enterobacteriaceae Facts

**http://www.cdc.gov/vitalsigns**

***About 4% of US hospitals had at least one patient with a CRE infection during the first half of 2012. About 18% of long-term acute care hospitals had one.**

***1 type of CRE infection has been reported in medical facilities in 42 states during the last 10 years.**

***CRE germs kill up to half of patients who get bloodstream infections from them.**

**CRE germs have found ways to beat antibiotics.**

◊ CRE infections are caused by a family of germs that are a normal part of a person's healthy digestive system. These germs can cause infections when they get into the bladder, blood, or other areas where germs don't belong.

◊ Some of these germs have become resistant to all or almost all antibiotics, including last-resort drugs called carbapenems. These resistant germs are called CRE.

◊ Almost all CRE infections happen to patients receiving serious medical care. CRE infections are hard to treat, and in some cases, untreatable. *CRE kill up to half of patients who get bloodstream infections from them.*

◊ In addition to spreading among people, CRE easily spread their antibiotic resistance to other kinds of germs, making those potentially untreatable as well.

**CRE infections are spreading, and urgent action is needed to stop them.**

◊ Although CRE germs are not very common, they have increased from 1% to 4% in the past decade. One type of CRE has increased from 2% to 10%.

◊ CRE are more common in some US regions, such as the Northeast, but 42 states report having had at least one patient test positive for one type of CRE.

◊ About 18% of long-term acute care hospitals and about 4% of short-stay hospitals in the US had at least one CRE infection during the first half of 2012.

◊ CRE's ability to spread themselves and their resistance raises the concern that potentially untreatable infections could appear in otherwise healthy people.

**CRE infections can be prevented.**

◊ Medical facilities in several states have reduced CRE infection rates by following CDC's prevention guidelines (see box).

◊ Israel decreased CRE infection rates in all 27 of its hospitals by more than 70% in one year with a coordinated prevention program.

◊ The US is at a critical time in which CRE infections could be controlled if addressed in a rapid, coordi nated, and consistent effort by doctors, nurses, lab staff, medical facility leadership, health depart ments/states, policy makers, and the federal government.

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# Thank You For Your Participation!

The Epidemiology Program would like to thank the Florida Hospital Centra Care locations throughout Seminole County for agreeing to participate in the 2012-2013 Influenza Sentinel Program.

For more information about Florida's List of Reportable Diseases/Conditions, please contact Gregory Danyluk, PhD at 407-665-3266.

| Selected Diseases/Conditions Reported to the Seminole County Health Department | 2013 through Week 8 | 2012 through Week 8 | 2011 through Week 8 | 2010–2012 Average through Week 8 |
|---|---|---|---|---|
| AIDS* | 4 | 10 | 6 | 10.3 |
| **Animal Bite to Humans**** | **3** | 2 | 2 | **1.7** |
| **Animal Rabies** | **2** | 2 | 0 | **1.0** |
| Campylobacteriosis | 5 | 9 | 5 | 4.7 |
| Chlamydia | 232 | 241 | 250 | 230.7 |
| Cryptosporidiosis | 0 | 2 | 1 | 1.7 |
| Cyclosporiasis | 0 | 0 | 0 | 0.0 |
| **Dengue** | **1** | 0 | 0 | **0.0** |
| ***E. coli Shiga toxin-producing*** | **2** | 0 | 1 | **0.3** |
| Giardiasis | 2 | 3 | 1 | 3.0 |
| **Gonorrhea** | **46** | 49 | 37 | **46.7** |
| ***Haemophilus influenzae (invasive)*** | **3** | 0 | 0 | **0.0** |
| Hepatitis A | 0 | 2 | 0 | 0.7 |
| Hepatitis B (acute and chronic) | 5 | 10 | 8 | 10.0 |
| **Hepatitis C (acute and chronic)** | **55** | 44 | 48 | **37.0** |
| Hepatitis B in Pregnant Women | 0 | 0 | 1 | 1.0 |
| HIV* | 7 | 7 | 11 | 8.0 |
| Lead poisoning | 0 | 1 | 1 | 0.7 |
| **Legionellosis** | **2** | 0 | 1 | **0.3** |
| Lyme Disease | 0 | 2 | 1 | 1.0 |
| Meningococcal Disease | 0 | 0 | 1 | 0.3 |
| **Pertussis** | **2** | 0 | 0 | **0.0** |
| Salmonellosis | 2 | 7 | 10 | 8.0 |
| Shigellosis | 1 | 9 | 1 | 3.7 |
| *S. pneumoniae – drug resistant* | 1 | 1 | 3 | 2.3 |
| Syphilis | 4 | 9 | 6 | 5.7 |
| **Tuberculosis** | **2** | 0 | 2 | **1.3** |
| **Varicella** | **5** | 5 | 0 | **3.7** |

***** HIV data includes those cases that have converted to AIDS. These HIV cases cannot be added with AIDS cases to get combined totals since the categories are not mutually exclusive. Current AIDS/HIV data are provisional at the county level.

****** Animal bite to humans by a potentially rabid animal resulting in a county health department or state health office recommendation for post-exposure prophylaxis (PEP), or a bite by a non-human primate.

Reported cases of diseases/conditions in **Bold** are >10% higher than the current three year average for the same time period.

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# What Can Be Done About CRE?

**Federal Government** is:

- ◊ Monitoring the presence of and risk factors for CRE infections through the National Healthcare Safety Network (NHSN) and Emerging Infections Program (EIP).
- ◊ Providing CRE outbreak support such as staff expertise, prevention guidelines, tools, and lab testing to states and facilities.
- ◊ Developing detection methods and prevention programs to control CRE. CDC's "Detect and Protect" effort supports regional CRE programs.
- ◊ Helping medical facilities improve antibiotic prescribing practices.

**States and Communities** can:

- ◊ Know CRE trends in your region.
- ◊ Coordinate regional CRE tracking and control efforts in areas with CRE. Areas not yet or rarely af fected by CRE infections can be proactive in CRE prevention efforts.
- ◊ Require facilities to alert each other when transferring patients with any infection.
- ◊ Consider including CRE infections on your state's Notifiable Diseases list.

**Health Care CEOs/Medical Officers** can:

- ◊ Require and strictly enforce CDC guidance for CRE detection, prevention, tracking, and reporting.
- ◊ Make sure your lab can accurately identify CRE and alert clinical and infection prevention staff when these germs are present.
- ◊ Know CRE trends in your facility and in the facilities around you.
- ◊ When transferring a patient, require staff to notify the other facility about infections, including CRE.
- ◊ Join or start regional CRE prevention efforts, and promote wise antibiotic use.

**Health Care Providers** can:

- ◊ Know if patients with CRE are hospitalized at your facility, and stay aware of CRE infection rates. Ask if your patients have received medical care somewhere else, including another country.
  -Request immediate alerts when the lab identifies CRE.
  -Alert the receiving facility when a patient with CRE transfers.
- ◊ Follow infection control recommendations with every patient, using contact precautions for patients with CRE. Whenever possible, dedicate rooms, equipment, and staff to CRE patients.
- ◊ Prescribe antibiotics wisely (http://www.cdc.gov/getsmart/healthcare). Use culture results to modify prescriptions if needed.
- ◊ Remove temporary medical devices such as catheters and ventilators as soon as possible.

**Patients** can:

- ◊ Tell your doctor if you have been hospitalized in another facility or country.
- ◊ Take antibiotics only as prescribed.
- ◊ Insist that everyone wash their hands before touching you.

**CDC's 2012 CRE Toolkit provides CRE prevention guidelines for doctors and nurses, hospitals, long-term acute care hospitals, nursing homes, and health departments. It gives step-by-step instructions for facilities treating patients with CRE infections and for those not yet affected by them. (http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html)**

For more information, please contact:
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Centers for Disease Control and Prevention 600 Clifton Road NE, Atlanta, GA 30333 Publication date: 3/5/2013